

Abstract

An improved method and process for array shape
inferencing for high-level array-based languages such as MATLAB
and APL. The process is based on a framework that algebraically
describes the shape of an expression at compile time. The method
leverages on algebraic properties that underlie MATLAB's shape
semantics and exactly captures the shape that the expression
assumes at run time. Other highlights of this method are its
generality and the uniformity of its approach. Compared with the
traditional shadow variable scheme, the algebraic view permits
powerful shape-related assertions and optimizations not possible in
the conventional approach.